Message

From: Africa Espina [guzuna@locustec.com]
Sent: 8/5/2022 6:47:06 PM
To: Abreu, Lilian [abreu.lilian@epa.gov]
CC: J. Wesley Hawthorne [hawthornej@locustec.com]; Woo, Cynthia [cynthia.woo@aptim.com]; Cacciatore, David [david.cacciatore@aptim.com]; Barker, Shau-Luen [ShauLuen.Barker@philips.com]; Nancy-Jeanne LeFevre [LeFevren@locustec.com]; Madeline Smedt [smedtm@locustec.com]
Subject: RE: Signetics EAB Phase II Performance Evaluation Report, CERCLIS Site ID CAD070466479
Attachments: SigneticsRevisedEABreport_coverletterRTC.pdf; Performance_Report_Revised_EPA_texttablesfigures.pdf; Performance_Report_revised_redline_EPA.pdf

Dear Lilian,

The Signetics EAB Phase II Evaluation Report has been revised based on EPA comments and discussions. Please see the following:

1)A cover letter including response to comments
2)A pdf of the report text, tables, and figures
3)A redline pdf of the text
4)The appendices are too large to attach. They can be downloaded here:
https://locustec-my.sharepoint.com/:f:/p/guzuna/EndD9wyOKnVNnOsqbCsA25cBCalexkgzfrmWMBtixoy7Ag?e=XdAy7x

Please let me know if you have any questions about this submission.

Have a good weekend!

Africa

Africa Espina Guzun
Manager of Environmental Services
phone: +1 (415) 799-9821
email: guzuna@locustec.com

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Mountain View, CA 94043
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From: Abreu, Lilian <abreu.lilian@epa.gov>
Sent: Tuesday, May 17, 2022 4:01 PM
To: Africa Espina <guzuna@locustec.com>
Cc: J. Wesley Hawthorne <hawthornej@locustec.com>; Woo, Cynthia <cynthia.woo@aptim.com>; Cacciatore, David <david.cacciatore@aptim.com>
Subject: RE: Signetics EAB Phase II Performance Evaluation Report, CERCLIS Site ID CAD070466479

Africa,

We are available on June 13th at 10 am, 2 or 3 pm.

Thank you,

Lilian Abreu, MS, PhD
Environmental Engineer - Remedial Project Manager
California Site Cleanup Section I
U.S. EPA, Region 9 Superfund and Emergency Management Division
75 Hawthorne Street, San Francisco, CA 94105
Office: 415.972-3010 | abreu.lilian@epa.gov

From: Africa Espina <guzuna@locustec.com>
Sent: Tuesday, May 17, 2022 3:03 PM
To: Abreu, Lilian <abreu.lilian@epa.gov>
Cc: J. Wesley Hawthorne <hawthornej@locustec.com>
Subject: RE: Signetics EAB Phase II Performance Evaluation Report, CERCLIS Site ID CAD070466479

Hi Lilian,
At our last call, we discussed setting up a meeting time after memorial day to discuss comments #1, #7, and #9a.

This is our availability as of today:

Wednesday, June 1: anytime from 11 am-4 pm
Wednesday, Jun 8: at 9 am or 11 am
Monday, June 13: 9 am, 10 am, 2 or 3 pm.

Please let us know what works best for your team.

Thanks!
Africa

From: Abreu, Lilian <abreu.lilian@epa.gov>
Sent: Thursday, April 28, 2022 3:55 PM
To: J. Wesley Hawthorne <hawthornej@locustec.com>
Cc: 'Shau Luen Barker' <shauluen.barker@philips.com>; Woo, Cynthia <cynthia.woo@aptim.com>; Africa Espina <guzuna@locustec.com>; Nancy-Jeanne LeFevre <LeFevren@locustec.com>; Madeline Smedt <smedtm@locustec.com>
Subject: RE: Signetics EAB Phase II Performance Evaluation Report, CERCLIS Site ID CAD070466479

Hello Wes,

Below are EPA technical comments on the Signetics EAB Phase II Performance Evaluation Report.
Please confirm receipt.

General Comments:

1. The study findings have shown that anaerobic bioremediation is effective at treating the dissolved contaminants of concern (COCs) at the site through the injection emulsified vegetable oil and a bioaugmentation culture. A larger scale application of the technology is appropriate.
2. Total organic carbon (TOC) monitoring was a critical parameter in the EAB evaluation. The complete TOC results for each well should be tabulated with the result summaries for direct comparison with the other key evaluation parameters. Groundwater TOC data is highly variable and should be evaluated as one of multiple lines of evidence.
3. Absolute dates should be provided with all data and table presentations. Reference to baseline and days or quarters since a baseline should be provided as additional, parenthetical information.
4. The figure numbering is not consistent with the callouts in the text.
5. The addition of bookmarks especially for the Appendices would be helpful for the reader.

Specific Comments:

1. Section 3.3, First Paragraph, Page 27: The text identifies deviations in the analyses of arsenic and manganese. An explanation for the deviations should be provided.
2. Section 4.2, Second Paragraph, Page 29: The text details the baseline TCE concentrations and should reference Figure 4 to aid in the interpretation.
3. Section 4.3.1, Second and Third Paragraphs, Page 32: The average radius of influence (ROI) is reported at 33 feet based upon effects on groundwater elevation. However, the text goes on to state that an "ROI of 20 feet should be retained for future implementations." An optimistic interpretation of the data is recommended for any larger scale application of EAB.
4. Section 4.4.1, Third Paragraph, Page 34:
    a. The text details the results of the low-pressure injection designed to evaluate: "1) at one injection point the injection pressure data was documented at flow rates between 10 to 25 gallons per minute, 2) at another injection point, flow rate data was collected at low pressure injections from gravity feed to 25 pounds per square inch (PSI) as based on achieved pressures and flowrates."
    b. Evaluation Parameter 1) is documented at INJ-6 using the TDIP tool with flowrates ranging from 10.1 gallons per minute (gpm) to 23 gpm and pressures from 45 PSI to 175 PSI.
    c. Evaluation Parameter 2) was not documented.
    d. The text states that, "the lower pressure achieved was the minimum observed during the study, therefore, observations on flowrates in response to pressures between gravity feed rates and 25 PSI were not feasible." There was no flow rate data evaluation from gravity feed to 25 PSI, or vice versa pressure data for flow rates from 0 – 10 gpm. A full-scale application of EAB may require this data for complete specification.
5. Section 4.5.1, Pages 37 and 38:
    a. The embedded table provides statistical information on TOC levels and persistence. The absolute dates should be provided with the basis and timeline information provided as additional detail (See General Comment 2).
    b. The text references Figure 5 a couple of times in relation to retention times; however, the figure shows the fixed "Actual" and "Estimated" ROIs without any temporal variation. It is not clear how the figure shows "retention time over the course of the study period at each sample location."
    c. The text should reference Table 6, the location of the TOC data collected, and the temporal plots of TOC for each well provided in Appendix H. The TOC results for each well should be tabulated with the results summaries of Table 9 and/or Table 10 for comparison with key evaluation parameters (See General Comment 1).
    d. TOC distribution is detailed but the depletion observed at most locations two weeks post injection is attributed to preferential pathways and groundwater gradients. The elevated sulfate present at the site should also be acknowledged as a contributing factor to substrate and TOC depletion.
6. Section 4.6.1:
    a. The text references Figure 6 as the fourth quarter TCE contours, but they are provided on Figure 7.
    b. The TCE mass removal estimates need further elaboration, including sample calculations provided with Table 8.

7. Section 5, Page 72: The section details the results of the investigation to evaluate "local hydrogeologic conditions and small-scale variability within the Phase II study area." The data indicate the presence of "multiple elevated groundwater velocity flow zones," which are attributed to the "rapid loss of TOC observed during the post-injection monitoring period." A detailed understanding of the groundwater flow patterns and lithologic characteristics of the study area are useful to interpret the pilot study data, but not necessary for an evaluation of EAB as a technology for large scale application at the site. The study has shown that anaerobic bioremediation is effective at treating the dissolved COCs at the site through the injection emulsified vegetable oil and a bioaugmentation culture. The distribution of injectates is always the challenge with in situ treatment technologies.
8. Section 7, Second Bullet, Page 87: The text refers to "general injection delivery rates were sustained at 170 PSI across the injection column and at flow rates up to 26 gpm." The injection delivery rate should be defined by the range of flow rates up to 26 gpm, with the applied force of 170 PSI.
9. Section 8, First Paragraph, Page 91 and 92:
    a. Several Bullets: The recommendation is for further evaluation in the pilot study area. Suggest refining the recommendation as an approach for continued source area treatment, rather than another evaluation of the specific lithology in the study area.
    b. Third Bullet: The recommendation is for a 20-foot ROI in the expansion of the EAB treatment area. Suggest an ROI range of 20-30 feet based upon the data. An optimistic interpretation of the data is recommended for a larger scale application of EAB at the site.
    c. Fourth Bullet: I agree with Locus' recommendation to "Conduct additional EAB performance groundwater monitoring at S138A and S158A to assess additional degradation by remaining TOC." TOC persists at these locations, and VOCs remain. Additional VOC degradation is expected with the anaerobic conditions and substrate. It is assumed that all monitoring parameters will be measured at these locations in this additional EAB performance groundwater monitoring for a complete assessment. Monitoring at S143A may also be useful in assessing the link between TOC and sulfate. At other locations once the TOC was utilized, the sulfate levels returned to baseline, but has yet to happen completely at S143A.
10. Table 8: Sample calculations should be provided to check the results provided.
11. Table 9 and/or 10: The TOC data should be included in one of these summary tables for assessment alongside other key evaluation parameters.
12. Figure 4: The "E" qualifier associated with the data for S158A should be noted in the legend.
13. Figure 5: The purpose of the figure and the reference in the text are unclear.
14. Figure 6: Suggest presenting the data as time-based contours, to show the change in TOC distribution over time.
15. Figure 7: Suggest combining Figure 7 with Figure 4 in some way, with colored contour areas to highlight the significant mass reduction achieved.

Let me know if you have questions and would like to discuss.

Thank you,

Lilian Abreu, MS, PhD
Environmental Engineer - Remedial Project Manager
California Site Cleanup Section I
U.S. EPA, Region 9 Superfund and Emergency Management Division
75 Hawthorne Street, San Francisco, CA 94105
Office: 415.972-3010 | abreu.lilian@epa.gov

From: J. Wesley Hawthorne <hawthornej@locustec.com>
Sent: Monday, February 28, 2022 1:00 PM
To: Schulman, Michael <Schulman.Michael@epa.gov>
Cc: 'Shau Luen Barker' <shauluen.barker@philips.com>; Woo, Cynthia <cynthia.woo@aptim.com>; Abreu, Lilian <abreu.lilian@epa.gov>; Africa Espina <guzuna@locustec.com>; Nancy-Jeanne LeFevre <LeFevren@locustec.com>; Madeline Smedt <smedtm@locustec.com>
Subject: RE: Signetics EAB Phase II Performance Evaluation Report, CERCLIS Site ID CAD070466479

Michael:

Sorry for the broken link. Here is an updated link for Appendix D:
EAB_P2_Performance_Report_Signetics_App D.pdf
Unfortunately, the combined report PDF is >80MB and cannot be uploaded as a single file. Most of this is due to the volume of lab reports in Appendix D.

J. Wesley Hawthorne, PE, PG
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From: Schulman, Michael <Schulman.Michael@epa.gov>
Sent: Monday, February 28, 2022 12:52 PM
To: J. Wesley Hawthorne <hawthornej@locustec.com>
Cc: 'Shau Luen Barker' <shauluen.barker@philips.com>; Woo, Cynthia <cynthia.woo@aptim.com>; Abreu, Lilian <abreu.lilian@epa.gov>; Africa Espina <guzuna@locustec.com>; Nancy-Jeanne LeFevre <LeFevren@locustec.com>; Madeline Smedt <smedtm@locustec.com>
Subject: RE: Signetics EAB Phase II Performance Evaluation Report, CERCLIS Site ID CAD070466479

The Appendix D link is not working. Can you also upload a single PDF of the report.

Thank you,
Michael

From: J. Wesley Hawthorne <hawthornej@locustec.com>
Sent: Friday, February 25, 2022 17:36
To: Schulman, Michael <Schulman.Michael@epa.gov>
Cc: 'Shau Luen Barker' <shauluen.barker@philips.com>; Woo, Cynthia <cynthia.woo@aptim.com>; Abreu, Lilian <abreu.lilian@epa.gov>; Africa Espina <guzuna@locustec.com>; Nancy-Jeanne LeFevre <LeFevren@locustec.com>; Madeline Smedt <smedtm@locustec.com>
Subject: Signetics EAB Phase II Performance Evaluation Report, CERCLIS Site ID CAD070466479

Michael,

The report *Performance Evaluation of Phase II In Situ Enhanced Anerobic Treatability Study* for the Signetics Site is now available for EPA review. It can be downloaded from our file share site through the following links (note that appendices are downloaded separately to manage the file size):

EAB_P2_Performance_Report_Signetics (FINAL).pdf

EAB_P2_Performance_Report_Signetics_App A-B.pdf

EAB_P2_Performance_Report_Signetics_App C.pdf

EAB_P2_Performance_Report_Signetics_App D.pdf

EAB_P2_Performance_Report_Signetics_App E.pdf

EAB_P2_Performance_Report_Signetics_App F.pdf

EAB_P2_Performance_Report_Signetics_App G - I.pdf

Please let me know if you have any questions.
Regards,

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President
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